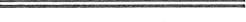


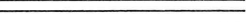
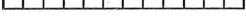









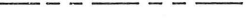



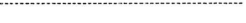
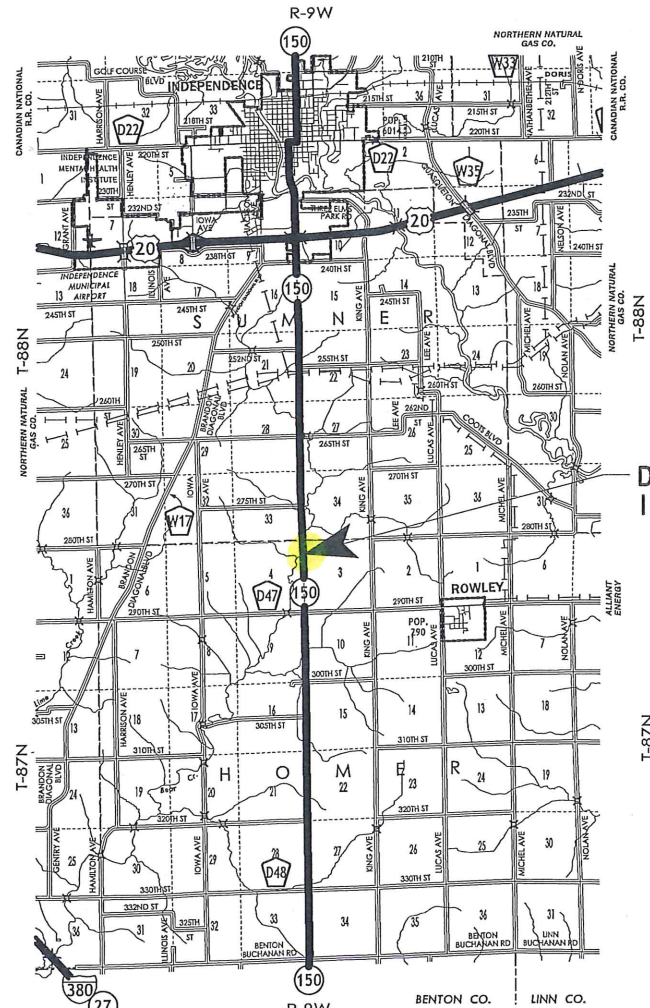
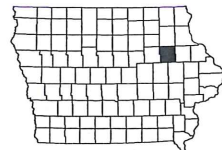


CONVENTIONAL SIGNS	
	DIVIDED HIGHWAY
	PAVED ROAD
	BITUMINOUS ROAD
	GRAVEL ROAD
	EARTH ROAD
	INTERSTATE HIGHWAY
	UNITED STATES HIGHWAY
	STATE HIGHWAY
	COUNTY HIGHWAY
	RAILROAD
	PIPELINE
	AIRPORT
	HYDROLOGY
	BRIDGE
	STATE BOUNDARY
	COUNTY BOUNDARY
	CORPORATE LIMIT LINE
	TOWNSHIP LINE
	SECTION LINE



LOCATION MAP

PROJECT DIRECTORY NAME: 1015001008



Iowa Department of Transportation

Highway Division

PLANS OF PROPOSED IMPROVEMENTS ON THE

## PRIMARY ROAD SYSTEM

### BUCHANAN COUNTY

#### BRIDGE REPLACEMENT - PPCB

#### IA 150 OVER BEAR CREEK

#### 0.9 MI. N. OF COUNTY RD D-47

THE IOWA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION, SERIES 2012, PLUS APPLICABLE GENERAL SUPPLEMENTAL SPECIFICATIONS, DEVELOPMENTAL SPECIFICATIONS, SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS SHALL APPLY TO CONSTRUCTION WORK ON THIS PROJECT.

**PRELIMINARY**  
NOT FOR CONSTRUCTION

DESIGN NO.  
113 & 213

REVISIONS TO THIS DESIGN PLAN AND/OR  
PROJECT SPECIFICATIONS SHOULD BE  
SUBMITTED BY 10-19-12

### ENGLISH STANDARD BRIDGE PLANS

STANDARD	ISSUED	REVISED

REVISIONS



1-800-292-8989

www.iowaonecall.com



Know what's below.  
Call before you dig.

### STANDARD ROAD PLANS

STANDARD ROAD PLANS ARE LISTED  
ON SHEET NUMBER C.5

### DESIGN DATA RURAL

2013	AADT	4549	V.P.D.
2033	AADT	5700	V.P.D.
2033	DHV	589	V.P.H.
TRUCKS		15	%
Total Design ESALs		7,900,000	

### INDEX OF SEALS

SHEET NO.	NAME	TYPE
I	JAMES S. NELSON	STRUCTURAL DESIGN
I	CHRISTINE E. KING	HYDRAULIC DESIGN
SPS.I, C.12	ROBERT L. STANLEY	GEOTECHNICAL DESIGN
A.I	YANXIAO JIA	ROADWAY DESIGN
BRIDGE STANDARDS	NORMAN L. McDONALD	STRUCTURAL DESIGN

### HYDRAULIC DESIGN



I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

Signature Christine E. King Date \_\_\_\_\_

Printed or Typed Name

My license renewal date is December 31, 2012

Pages or sheets covered by this seal: SHEET 4 OF 90

### STRUCTURAL DESIGN



I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

Signature James S. Nelson Date \_\_\_\_\_

Printed or Typed Name

My license renewal date is December 31, 2013

Pages or sheets covered by this seal: SHEETS I THRU 31 OF 90

ESTIMATED BRIDGE QUANTITIES					
ITEM NO.	ITEM CODE	ITEM	UNIT	TOTAL	AS BUILT QUAN.
1	2401-6745625	REMOVAL OF EXISTING BRIDGE	LS	1.00	
2	2402-2720000	EXCAVATION, CLASS 20	CY	234	
3	2403-0100010	STRUCTURAL CONCRETE (BRIDGE)	CY	458.7	
4	2404-7775000	REINFORCING STEEL	LB	7,898	
5	2404-7775005	REINFORCING STEEL, EPOXY COATED	LB	94,302	
6	2407-0551355	BEAMS, PRETENSIONED PRESTRESSED CONCRETE, C55	EACH	14	
7	2407-0551380	BEAMS, PRETENSIONED PRESTRESSED CONCRETE, C80	EACH	7	
8	2408-7800000	STRUCTURAL STEEL	LB	6,166	
9	2414-6424110	CONCRETE BARRIER RAILING	LF	440.0	
10	2501-0201057	PILES, STEEL, HP 10 X 57	LF	3,270	
11	2501-5478057	CONCRETE ENCASEMENT OF STEEL H PILES, HP 10 X 57 (PIOL TYPE 3)	LF	269.5	
12	2501-6335010	PREBORED HOLES	LF	200	
13	2507-3250005	ENGINEERING FABRIC	SY	535.0	
14	2507-6800061	REVTMENT, CLASS E	TON	615.0	
15	2507-8029000	EROSION STONE	TON	16.5	
16	2520-3350015	FIELD OFFICE	EACH	1	
17	2526-8285000	CONSTRUCTION SURVEY	LS	1.00	
18	2533-4980005	MOBILIZATION	LS	1.00	
19	2601-2638650	BRIDGE WING ARMORING - EROSION STONE	SY	22.2	

ESTIMATE REFERENCE INFORMATION		
ITEM NO.	ITEM CODE	DESCRIPTION
1	2401-6745625	REMOVAL OF EXISTING BRIDGE ALL BRIDGE REMOVAL DEBRIS DROPPED INTO BEAR CREEK SHALL BE REMOVED WITHIN 4 DAYS.
2	2402-2720000	EXCAVATION, CLASS 20 --
3	2403-0100010	STRUCTURAL CONCRETE (BRIDGE) INCLUDES COST OF FURNISHING AND PLACING SPLASH BASINS (INCLUDING EXCAVATION, EROSION STONE OR CLASS E REVTMENT, AND ENGINEERING FABRIC).  INCLUDES ALL PREFORMED EXPANSION JOINT FILLER REQUIRED.  INCLUDES FURNISHING AND PLACING SUBDRAIN (INCLUDING EXCAVATION), FLOODABLE BACKFILL, POROUS BACKFILL, GEOTEXTILE FABRIC, WATER FLOODING, AND SUBDRAIN OUTLET AT ABUTMENTS AND TOE OF BERM.  INCLUDES FURNISHING AND PLACING 3 INCH DIAMETER PVC PLASTIC PIPE AND EXPANDING FOAM IN THE ABUTMENT WINGS.
4	2404-7775000	REINFORCING STEEL --
5	2404-7775005	REINFORCING STEEL, EPOXY COATED --
6	2407-0551355	BEAMS, PRETENSIONED PRESTRESSED CONCRETE, C55 COARSE AGGREGATES FOR PRESTRESSED CONCRETE BRIDGE UNITS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION 4115 CLASS III DURABILITY. GRADATION OF THE COARSE AGGREGATE SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF ARTICLE 2407.02, A, OF THE STANDARD SPECIFICATIONS.  INCLUDES PIER AND ABUTMENT BEARING MATERIAL.
7	2407-0551380	BEAMS, PRETENSIONED PRESTRESSED CONCRETE, C80 COARSE AGGREGATES FOR PRESTRESSED CONCRETE BRIDGE UNITS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION 4115 CLASS III DURABILITY. GRADATION OF THE COARSE AGGREGATE SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF ARTICLE 2407.02, A, OF THE STANDARD SPECIFICATIONS.  INCLUDES PIER BEARING MATERIAL.
8	2408-7800000	STRUCTURAL STEEL INCLUDES COST OF 12 DRAINS AT 106 LBS STEEL PER DRAIN.

ESTIMATE REFERENCE INFORMATION		
ITEM NO.	ITEM CODE	DESCRIPTION
9	2414-6424110	CONCRETE BARRIER RAILING INCLUDES MATERIAL AND LABOR ASSOCIATED WITH PROVIDING AND INSTALLING THE RIGID STEEL CONDUIT, JUNCTION BOXES AND FITTINGS.  INCLUDES 224 LF OF 2" DIAMETER RIGID STEEL CONDUIT.  INCLUDES 45.9 CY OF CLASS C OR CLASS BR STRUCTURAL CONCRETE AND 11066 LBS OF EPOXY COATED REINFORCING STEEL.  IF PLACEMENT OF CONCRETE IS DONE BY THE SLIPFORMING METHOD, CLASS BR CONCRETE IS REQUIRED. CAST-IN-PLACE BARRIER RAILS SHALL USE CLASS C MIX. PRICE BID FOR THIS ITEM SHALL INCLUDE THE COST OF CAST-IN-PLACE FORMS IF REQUIRED FOR PLACEMENT OF THE CONCRETE.
10	2501-0201057	PILES, STEEL, HP 10 X 57 --
11	2501-5478057	CONCRETE ENCASEMENT OF STEEL H PILES, HP 10 X 57 (PIOL TYPE 3) SHALL BE FULL PAYMENT FOR NECESSARY EXCAVATIONAND FOR FURNISHING AND PLACING ALL MATERIAL.
12	2501-6335010	PREBORED HOLES --
13	2507-3250005	ENGINEERING FABRIC INCLUDES FURNISHING AND PLACING UNDER REVTMENT AND EROSION STONE.
14	2507-6800061	REVTMENT, CLASS E ESTIMATED AT 1.6 TON/CY.  INCLUDES 360 TONS AT SOUTH BANK AND 255 TONS AT NORTH BANK.
15	2507-8029000	EROSION STONE INCLUDES FURNISHING AND PLACING EROSION STONE AT ABUTMENT BERMS AND ALL REQUIRED SHAPING AND COMPACTING.  ESTIMATED AT 1.6 TON/CY.
16	2520-3350015	FIELD OFFICE --
17	2526-8285000	CONSTRUCTION SURVEY --
18	2533-4980005	MOBILIZATION --
19	2601-2638650	BRIDGE WING ARMORING - EROSION STONE INCLUDES FURNISHING AND PLACING ENGINEERING FABRIC, EROSION STONE, AND ALL REQUIRED EXCAVATING, SHAPING AND COMPACTING FOR WING ARMORING.

NOTE:  
ROADWAY QUANTITIES SHOWN  
ELSEWHERE IN THESE PLANS.

DESIGN FOR 40° SKEW (R.A.)  
**193'-0 x 44' PRETENSIONED PRESTRESSED  
CONCRETE BEAM BRIDGE**  
55'-9 END SPANS 81'-6 INTERIOR SPAN  
**QUANTITIES**  
STATION: 308+14.67 NOVEMBER, 2012  
**BUCHANAN COUNTY**  
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
DESIGN SHEET NO. 1 OF 23 FILE NO. 30661 DESIGN NO. 113

GENERAL NOTES:

IT IS THE INTENT OF THIS DESIGN TO CONSTRUCT A 193'-0 x 44' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE, SKEWED 40°, ON IA 150 AT STATION 308+14.67.

THIS DESIGN IS FOR THE REPLACEMENT OF THE EXISTING 126'-0 x 26' CONTINUOUS CONCRETE SLAB BRIDGE, DESIGN NO. 154. PLANS OF THE EXISTING STRUCTURE WILL BE MADE AVAILABLE TO THE CONTRACTOR. CONTACT THE OFFICE OF CONTRACTS - HIGHWAY DIVISION - IOWA D.O.T. - AMES.

THE LUMP SUM BID FOR "REMOVAL OF EXISTING BRIDGE" SHALL INCLUDE REMOVAL OF THE EXISTING 126'-0 X 26'-0 CONTINUOUS CONCRETE SLAB BRIDGE.

REMOVALS SHALL BE IN ACCORDANCE WITH SECTION 240I, OF THE STANDARD SPECIFICATIONS.

THIS BRIDGE IS DESIGNED FOR HL-93 LOADING, PLUS 20 LBS. PER SQUARE FOOT OF ROADWAY FOR FUTURE WEARING SURFACE.

FAINT LINES ON PLANS INDICATE THE EXISTING STRUCTURE.

UTILITY COMPANIES WHOSE FACILITIES ARE SHOWN ON THE PLANS OR KNOWN TO BE WITHIN THE CONSTRUCTION LIMITS SHALL BE NOTIFIED BY THE BRIDGE CONTRACTOR OF THE STARTING DATE.

THE CONTRACTOR SHALL NOTE THE STANDARD ABUTMENT DETAILS HAVE BEEN MODIFIED TO OFFSET THE ABUTMENT FOOTING FROM THE WINGWALL TO AID IN TYING THE REINFORCING STEEL BETWEEN THE FOOTING TO WINGWALL AND THE FOOTING TO BACKWALL.

IT SHALL BE THE BRIDGE CONTRACTOR'S RESPONSIBILITY TO PROVIDE SITES FOR EXCESS EXCAVATED MATERIAL. NO PAYMENT FOR OVERHAUL WILL BE ALLOWED FOR MATERIAL HAULED TO THESE SITES.

THE BRIDGE CONTRACTOR WILL BE THE ONLY CONTRACTOR AT THE SITE AND IS RESPONSIBLE FOR THE COMPLETION OF ALL WORK AS DETAILED AND NOTED IN THESE PLANS.

THE BRIDGE CONTRACTOR SHALL PREBORE HOLES FOR ABUTMENT PILES. HOLES SHALL BE BORED TO THE ELEVATIONS SHOWN ON THE "LONGITUDINAL SECTION ALONG CENTERLINE ROADWAY" ON DESIGN SHEET 3. PILES SHALL BE DRIVEN THROUGH THE HOLES TO AT LEAST THE SPECIFIED DESIGN BEARING.

CONCRETE BARRIER RAILS PLACED USING THE SLIPFORM METHOD WILL REQUIRE THE USE OF A CLASS BR CONCRETE IN ACCORDANCE WITH ARTICLE 2513.03, A, 2, OF THE STANDARD SPECIFICATIONS. CAST-IN-PLACE BARRIER RAILS SHALL USE CLASS C MIX. CLASS D CONCRETE IS NOT PERMITTED FOR CONCRETE BARRIER RAILS (CAST-IN-PLACE OR SLIPFORMED METHOD).

KEYWAY DIMENSIONS SHOWN ON THE PLANS ARE BASED ON NOMINAL DIMENSIONS UNLESS STATED OTHERWISE. IN ADDITION, THE BEVEL USED ON THE KEYWAY SHALL BE LIMITED TO A MAXIMUM OF 10 DEGREES FROM VERTICAL.

CONCRETE FORMS ARE REQUIRED TO REMAIN IN PLACE 5 DAYS OR LONGER IN ACCORDANCE WITH ARTICLE 2403.03, M, 2, OF THE STANDARD SPECIFICATIONS, EXCEPT THE MINIMUM CONCRETE FLEXURAL STRENGTH REQUIRED BEFORE REMOVAL OF FORMS SHALL BE 575 PSI.

SPECIFICATIONS:

DESIGN: AASHTO LRFD 4TH ED. SERIES OF 2007  
CONSTRUCTION: IOWA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION, SERIES 2012, PLUS APPLICABLE GENERAL SUPPLEMENTAL SPECIFICATIONS, DEVELOPMENTAL SPECIFICATIONS, SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS SHALL APPLY TO CONSTRUCTION WORK ON THIS PROJECT.

DESIGN STRESSES:

DESIGN STRESSES FOR THE FOLLOWING MATERIALS ARE IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 4TH ED. SERIES OF 2007.  
REINFORCING STEEL IN ACCORDANCE WITH SECTION 5, GRADE 60.  
CONCRETE IN ACCORDANCE WITH SECTION 5, f'c = 4,000 PSI.  
PRESTRESSED CONCRETE BEAMS, SEE DESIGN SHEET 15.  
STRUCTURAL STEEL IN ACCORDANCE WITH SECTION 6 ASTM A709 GRADE 36.

THESE BRIDGE PLANS LABEL ALL REINFORCING STEEL WITH ENGLISH NOTATION (5d1 IS 5/8 INCH DIAMETER BAR). ENGLISH REINFORCING STEEL RECEIVED IN THE FIELD MAY DISPLAY THE FOLLOWING "BAR DESIGNATION". THE "BAR DESIGNATION" IS THE STAMPED IMPRESSION ON THE REINFORCING BARS, AND IS EQUIVALENT TO THE BAR DIAMETER IN MILLIMETERS.

ENGLISH SIZE	3	4	5	6	7	8	9	10	11
BAR DESIGNATION	10	13	16	19	22	25	29	32	36

BRIDGE DECK DIMENSIONS TABLE

NO.	ITEM	UNIT	QUANTITY
1	DECK LENGTH	L.F.	196'-11
2	MINIMUM DECK WIDTH	L.F.	47'-2
3	MAXIMUM DECK WIDTH	L.F.	47'-2
4	DECK AREA	S.F.	9287.9

1. DECK LENGTH IS MEASURED FROM FACE-TO-FACE OF PAVING NOTCHES ALONG THE CENTERLINE OF THE ROADWAY.  
2, 3. DECK WIDTHS ARE MEASURED FROM OUT-TO-OUT OF DECK PERPENDICULAR TO THE CENTERLINE OF ROADWAY.  
4. DECK AREA IS TO BE BASED ON THE FACE-TO-FACE PAVING NOTCH DISTANCE AND OUT-TO-OUT DECK DIMENSIONS.

NOTE:

RL-16 TEMPORARY STREAM CROSSING, CAUSEWAY, OR EQUIPMENT PAD IS NOT AUTHORIZED FOR THIS PROJECT.

NO EQUIPMENT SHALL BE DRIVEN INTO THE CREEK.

NOTE:

POLLUTION PREVENTION PLAN SHOWN ELSEWHERE IN THESE PLANS.

TRAFFIC CONTROL PLAN

NOTE: THE ROADWAY WILL BE OPEN TO THRU TRAFFIC. REFER TO THE TRAFFIC CONTROL PLAN SHOWN ELSEWHERE IN THESE PLANS.

DESIGN FOR 40° SKEW (R.A.)

193'-0 x 44' PRETENSIONED PRESTRESSED  
CONCRETE BEAM BRIDGE

55'-9 END SPANS

81'-6 INTERIOR SPAN

GENERAL NOTES

STATION: 308+14.67

NOVEMBER, 2012

BUCHANAN COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 2 OF 23 FILE NO. 30661 DESIGN NO. 113

910	CL S. ABUT. BRG. P.G.L. ELEV. 900.30	TOP BERM ELEV.=893.62	CL PIER #1 P.G.L. ELEV. 900.40	CL PIER #2 P.G.L. ELEV. 900.32	TOP BERM ELEV.=893.40	CL N. ABUT. BRG. P.G.L. ELEV. 900.10	910
900							900
890							890
880	BOTT. FTG. ELEV. 891.62	BOTT. CAP ELEV.=892.32	DES. HW=892.69	BOTT. CAP ELEV.=892.21	BOTT. FTG. ELEV. 891.40		880
870	BOTT. PREBORED HOLE ELEV. 881.6	TOP ELEV.=889.00	BOTT. CONC. ENCASEMENT ELEV.=881.90	CL STREAMBED ELEV.=884.90	BOTT. PREBORED HOLE ELEV. 881.4		870
860	(10) 70' HP10x57 STEEL BEARING PILING	2.5:1 (NORMAL)	(13) 70' HP10x57 STEEL BEARING PILING	(13) 70' HP10x57 STEEL BEARING PILING	(10) 75' HP10x57 STEEL BEARING PILING		860

## UTILITIES LEGEND:

T1 ALLIANT ENERGY  
 F0 IOWA TELECOM TELEPHONE  
 F02 QWEST FIBEROPTIC  
 IOWA TELECOM FIBEROPTIC

0.500% -0.500%

PI STA 307+91.027 VC = 245'  
 PI ELEV 900.71

## PROPOSED PROFILE GRADE ON IA 150

PROFILE GRADE LINE (P.G.L.) IS AT CL OF ROADWAY.  
 TOP OF BRIDGE DECK AT CL ROADWAY IS 0.03' BELOW THE  
 CALC. PROFILE GRADE TO ACCOUNT FOR PARABOLIC CROWN.

## LONGITUDINAL SECTION ALONG CL APPROACH ROADWAY

196'-11" FACE TO FACE OF PAVING NOTCHES

## LOW STEPS FOR LONGITUDINAL SECTION

S. ABUT. = 895.12

PIER #1 = 895.32

PIER #2 = 895.21

N. ABUT. = 894.90

## BERM SLOPE LOCATION TABLE

	SOUTH ABUTMENT			NORTH ABUTMENT		
	STATION	OFFSET	ELEV	STATION	OFFSET	ELEV
A1	307+16.15	-26.58	889.00	308+69.03	-26.58	889.00
A2	307+60.76	26.58	889.00	309+13.64	26.58	889.00
B1	307+01.74	-26.58	893.62	308+82.99	-26.58	893.40
B2	307+46.35	26.58	893.62	309+27.60	26.58	893.40
W1	306+86.42	-26.58	899.43	309+06.00	-26.58	899.38
W2	307+23.34	26.58	899.56	309+42.92	26.58	899.20

ALL POINTS REFLECT GRADING SURFACE & ARE TAKEN FROM SURVEY CL

## HYDRAULIC DATA

DRAINAGE AREA= 16.5 MI<sup>2</sup> ROLLING  
 STREAM SLOPE= 8.76 FT./MI.

Q<sub>2</sub> = 734 CFS  
 STAGE= 890.89  
 CHANNEL VELOCITY= 2.25 FT/SEC

Q<sub>50</sub> = 3158 CFS  
 NATURAL STAGE= 892.69  
 BACKWATER= 893.49  
 AVG. BRIDGE VELOCITY= 6.17 FT/SEC

Q<sub>100</sub> = 3760 CFS  
 NATURAL STAGE= 892.97  
 BACKWATER= 894.07  
 AVG. BRIDGE VELOCITY= 7.08 FT/SEC  
 CALCULATED DESIGN SCOUR= 879.70

Q<sub>500</sub> = 4927 CFS  
 NATURAL STAGE= 893.42  
 AVG. BRIDGE VELOCITY= 8.34 FT/SEC  
 CALCULATED CHECK SCOUR= 879.50

BRIDGE IS IN ZONE A  
 BUCHANAN CO. FIS

## LOCATION

IA 150 OVER BEAR CREEK  
 T-87N R-9W  
 SECTION 3/4  
 HOMER TOWNSHIP  
 BUCHANAN COUNTY  
 FHWA NO. 015921  
 BRIDGE MAINT. NO. 1034.9S150  
 LATITUDE 42.382778  
 LONGITUDE -91.889485

## 193'-0" x 44' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

55'-9" END SPANS 81'-6" INTERIOR SPAN

## SITUATION PLAN

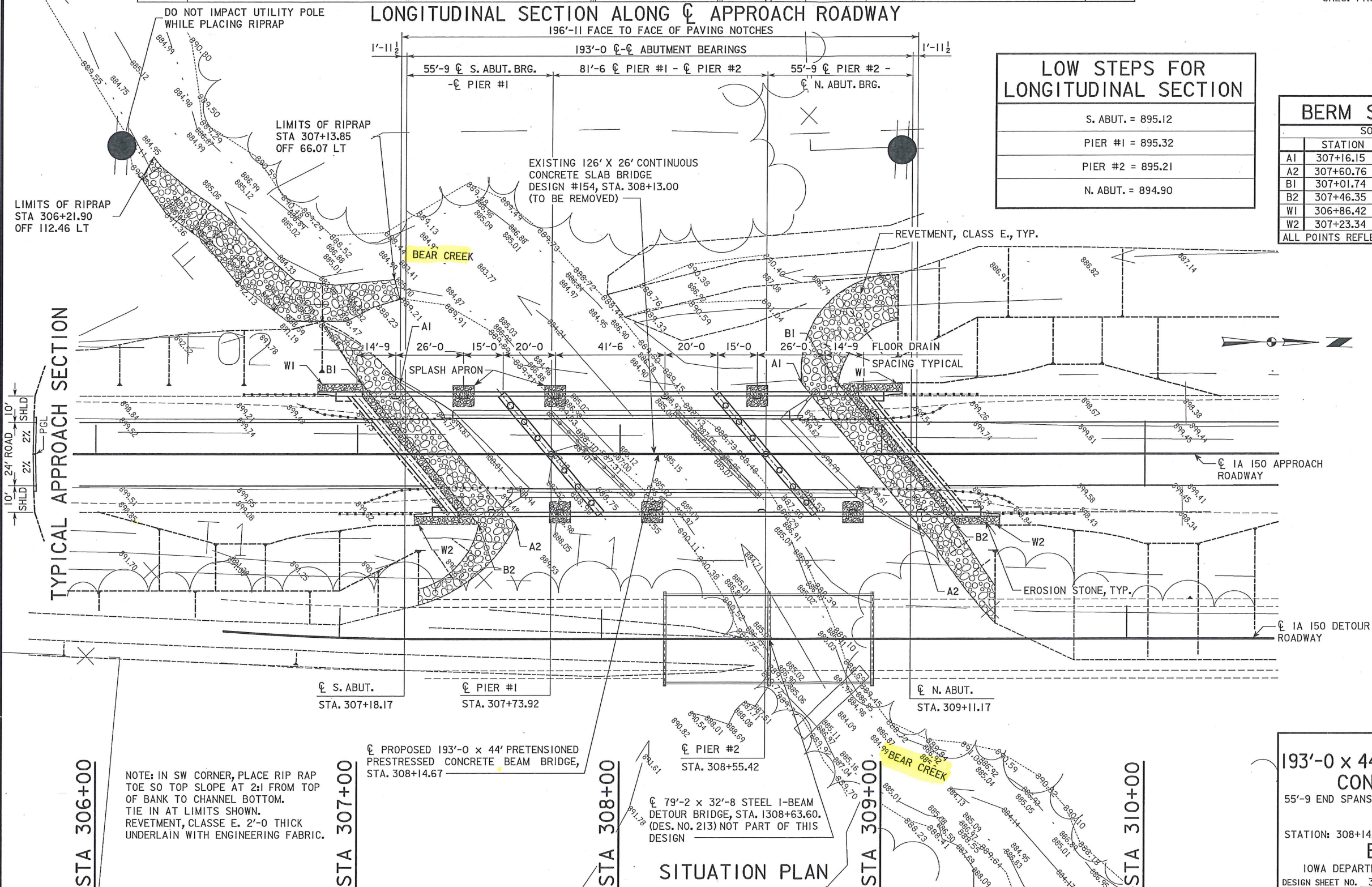
STATION: 308+14.67 NOVEMBER, 2012

## BUCHANAN COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 3 OF 23 FILE NO. 30661 DESIGN NO. 113

## SITUATION PLAN

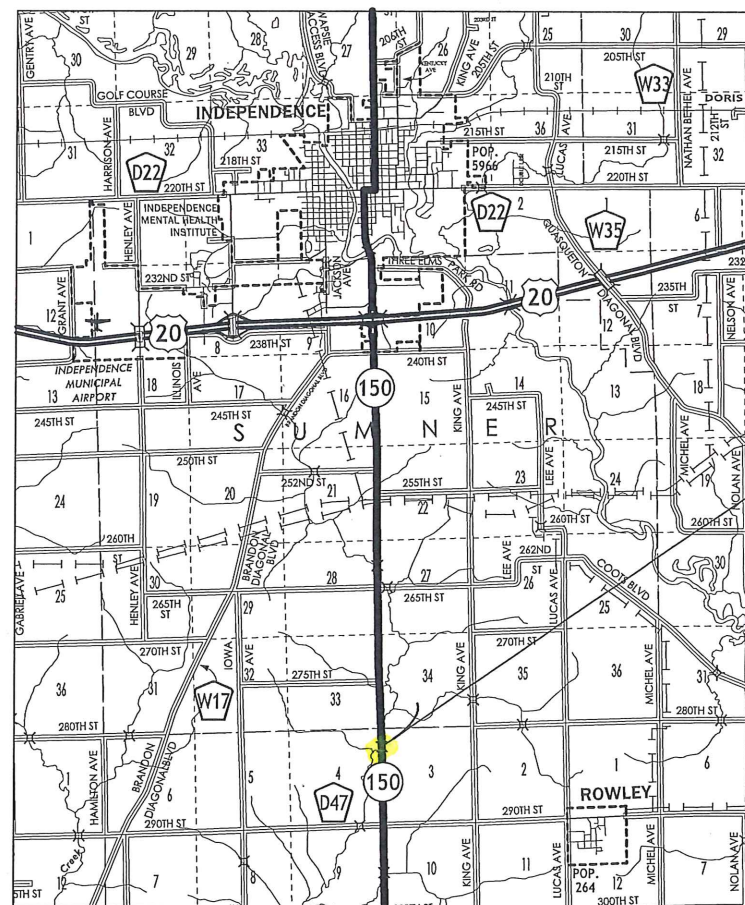


DESIGN TEAM JSN / DAW / JDC / TSA

BUCHANAN COUNTY

PROJECT NUMBER BRFN-150-3(67)--39-10

SHEET NUMBER 4



NO MILEAGE SUMMARY

STA. 308+13.04  
PROJECT LOCATION

101-4			
04-30-02			
DESIGN DATA RURAL			
2013 AADT	4549	V.P.D.	
2033 AADT	5700	V.P.D.	
2033 DHV	589	V.P.H.	
TRUCKS	15	%	
Total			
Design ESALs	7,900,000		

INDEX OF SHEETS	
No.	DESCRIPTION
A Sheets	Title Sheets
A.1	Title Sheet
B Sheets	Typical Cross Sections and Details
B.1 - 4	Typical Cross Sections and Details
C Sheets	Quantities and General Information
C.1 - 12	Tabulations
D Sheets	Mainline Plan and Profile Sheets
* D.1	Plan & Profile Legend Sheet
* D.2	IA 150 Mainline Plan & Profile Sheet
F Sheets	Detour or Temporary Pavement Sheets
* F.1	IA 150 Detour Plan and Profile Sheet
G Sheets	Survey Sheets
G.1 - 3	Reference Ties and Bench Marks
G.4 - 5	Alignment Coordinates & Superelevation
H Sheets	Right-of-Way Sheets
H.1	IA 150 Mainline & Detour
J Sheets	Traffic Control and Staging Sheets
J.1	Traffic Control Plan
J.1	Staging Notes
J.1	Tabulation of Special Events
L Sheets	Geometric, Staking and Jointing Sheets
L.1 - 2	Geometric & Staking "Mainline or Side Road Name"
T Sheets	Earthwork Quantity Sheets
T.1 - 2	Earthwork Quantity Sheets
U Sheets	500 Series, Mod.Stds. and Detail Sheets
U.1	Temporary Barrier Rail Placement Details
W Sheets	Mainline Cross Sections
W.1	Cross Sections Legend Sheet
W.2 - 11	IA 150 Detour Cross Sections
W.12 - 23	IA 150 Mainline Cross Sections
* Color Plan Sheets	



## ROADWAY DESIGN



I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

Signature Yanxiao Jia 09-19-2012  
Date  
Printed or Typed Name  
My license renewal date is December 31, 2012

Pages or sheets covered by this seal: A.1, B.1-B.4, C.1-C.11, D.1-D.2, E.1, G.1-G.5, H.1-H.2, J.1, L.1-L.2, T.1-T.2, U.1, W.1-W.23

Design No. 113/213  
File No. 30661

Design No. 113/213  
File No. 30661

ESTIMATE REFERENCE INFORMATION

Item No.	Item Code	Description
1	2101-0850001	CLEARING AND GRUBBING Includes clearing and grubbing necessary for installation of bridge.
2	2102-0425070	SPECIAL BACKFILL Refer to Typical 2 Detour and Typical 7156 on Sheets B.3 and B.4, respectively, for locations and details. Includes 943 tons of material for the Detour subbase, 328 tons of material for paved shoulders at guardrail on mainline and 1939 tons for the detour bridge abutments. Also refer to Tab. 112-9 and the Bridge Plans for more information.
3	2102-2710070	EXCAVATION, CLASS 10, ROADWAY AND BORROW Refer to "T" sheets.  Stage 1: Includes 636 cu. yds. of Class 10 cut and 7263 cu. yds. of Contractor furnished borrow for a runaround detour. Quantity also includes 1026 cu. yds. of Class 10 cut for detour bridge abutments. Refer to the Bridge Plans for more information.  Stage 2: Includes 1588 cu. yds. of Class 10 cut and 860 cu. yds. of Contractor furnished borrow for mainline. Quantity also includes 265 cu. yds. of excavations from below the grading surface for revetment placement. Refer to the Bridge Plans for locations and details.  Stage 3: Includes 7923 cu. yds. of Class 10 excavation to the runaround detour embankment. 1303 cu. yds. of fill will be used from this quantity to fill detour ditches to existing ground conditions.  The remaining 6620 cu. yds. of Class 10 to be wasted, as per Article 1106.07 of the current specifications. Overhaul will not be paid for on this item.  Totals: Class 10 Cut = 11438 cu. yds. Borrow = 8123 cu. yds. Waste = 6620 cu. yds.  Special attention should be given to Section 2107.03.C, Standard Specificaliton Series of 2009, on this project.
4	2102-2712015	EXCAVATION, CLASS 12, BOULDERS OR ROCK FRAGMENTS Refer to Tab. 103-7.
5	2105-8425005	TOPSOIL, FURNISH AND SPREAD Refer to Tab. 103-4. The Contractor shall provide all the required topsoil and follow provisions in Section 2105 of the current specifications.  Method of Mesurement: The quantity of topsoil furnished and spread will be measured in cubic yards and will be computed on the depth of topsoil specified in the contract document over the area involved plus 40% to account for compaction shrinkage and hauling losses. Sufficent field measurements will be taken to assure reasonable conformity with the required final thickness of topsoil in place.  Basis of Payment: The Contractor will be paid the contract unit price for topsoil, furnish and spread per cubic yard of topsoil placed, measured as provided above.  Overhaul will not be paid for on this item.
6	2105-8425015	TOPSOIL, STRIP, SALVAGE AND SPREAD Includes 574 cu. yds. available from stripping a nominal one foot of toposil. Refer to Tab. 103-4 for location and details.
7	2113-0001100	SUBGRADE STABILIZATION MATERIAL, POLYMER GRID Refer to the Bridge Plans for more information.
8	2115-0100000	MODIFIED SUBBASE To be used on mainline. Refer to Roadway Typical on Sheet B.2 for locations and details.
9	2121-7425010	GRANULAR SHOULDERS, TYPE A Includes 21 tons for mainline shoulders and 562.5 tons for Detour shoulders. Also includes 340.0 tons to reshape mainline shoulders for the proposed final foreslopes. Refer to Tab. 112-9 and Typical 7136-X on Sheet B.3 for locations and details.
10	2121-8450810	TRENCHING AND RESHAPING Refer to Typical 7136-X on Sheet B.3 for locations and details.
11	2122-5190501	PAVED SHOULDER, PORTLAND CEMENT CONCRETE (PAVED SHOULDER PANEL FOR BRIDGE END DRAIN) Refer to Tab. 104-8A.

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## ESTIMATE REFERENCE INFORMATION

[illegible]

SHEET NUMBER	C.4
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## On-Site Detour Notes

## EROSION CONTROL

## Special Note

## UTILITIES

(NOT A POINT 25 PROJECT)

## RESTRICTED STREAM ACCESS

## SECTION 404 PERMIT AND CONDITIONS

## SECTION 404 PERMIT AND CONDITIONS

Design No. 113/213  
File No. 30661

POLLUTION PREVENTION PLAN

This Base Pollution Prevention Plan (PPP) includes information on Roles and Responsibilities, Project Site Description, Controls, Maintenance Procedures, Inspection Requirements, Non-Storm Water Controls, Potential Sources of Off Right-of-Way Pollution, and Definitions. This plan references other documents rather than repeating the information contained in the documents. A copy of this Base Pollution Prevention Plan, amended as needed per plan revisions or by contract modification, will be readily available for review.

All contractors shall conduct their operations in a manner that controls pollutants, minimizes erosion, and prevents sediments from entering waters of the state and leaving the highway right-of-way. The prime contractor shall be responsible for compliance and implementation of the PPP for their entire contract. This responsibility shall be further shared with subcontractors whose work is a source of potential pollution as defined in this PPP.

I. ROLES AND RESPONSIBILITIES

- A. Designer:
1. Prepares Base PPP included in the project plan.
  2. Prepares Notice of Intent (NOI) submitted to Iowa DNR.
  3. Signature authority on the Base PPP and NOI.
- B. Contractor/Subcontractor:
1. Affected contractors/subcontractors are co-permittees with the IDOT and will sign a certification statement adhering to the requirements of the NPDES permit and this PPP plan. All co-permittees are legally required under the Clean Water Act and the Iowa Administrative Code to ensure compliance with the terms and conditions of this PPP.
  2. Submit a detailed schedule according to Article 2602 of the Specifications and any additional plan notes.
  3. Install and maintain appropriate controls.
  4. Supervise and implement good housekeeping practices.
  5. Conduct joint required inspections of the site with inspection staff.
  6. Signature authority on Co-Permittee Certification Statements and storm water inspection reports.
- C. RCE/Inspector:
1. Update PPP whenever there is a change in design, construction, operation or maintenance, which has a significant effect on the discharge of pollutants from the project.
  2. Maintain an up-to-date list that identifies contractors and subcontractors as co-permittees.
  3. Make these plans available to the DNR upon their request.
  4. Conduct joint required inspections of the site with the contractor/subcontractor.
  5. Complete an inspection report after each inspection.
  6. Signature authority on storm water inspection reports and Notice of Discontinuation (NOD).

II. PROJECT SITE DESCRIPTION

- A. This Pollution Prevention Plan (PPP) is for the construction of a on-site detour and bridge on Iowa 150 over Bear Creek.
- B. This PPP covers approximately 5.86 acres with an estimated 3.53 acres being disturbed. The portion of the PPP covered by this contract has 3.53 acres disturbed.
- C. The PPP is located in an area of one soil association (Kenyon-Floyd-Clyde). The estimated average SCS runoff curve number for this PPP after completion will be 64.
- D. Storm Water Site Map - Multiple sources of information comprise the base storm water site map including:
1. Drainage patterns - Plan and Profile sheets and Situation plans.
  2. Proposed Slopes - Cross Sections.
  3. Areas of Soil Disturbance - construction limits shown on Plan and Profile sheets.
  4. Location of Structural Controls - Tabulations on C sheets.
  5. Locations of Non-structural Controls - Tabulations on C sheets.
  6. Locations of Stabilization Practices - generally within construction limits shown on Plan and Profile sheets.
  7. Surface Waters (including wetlands) - Plan and Profile sheets.
  8. Locations where storm water is discharged - Plan and Profile sheets.
- E. The base site map is amended by contract modifications and progress payments of completed erosion control work.
- F. Runoff from this work will flow into unnamed ditches then into Bear Creek.

III. CONTROLS

- A. The contractor's work plan and sequence of operations specified in Article 2602.03 for accomplishment of storm water controls should clearly describe the intended sequence of major activities and for each activity define the control measure and the timing during the construction process that the measure will be implemented.
- B. Preserve vegetation in areas not needed for construction.
- C. Section 2601 and 2602 of the Standard Specifications define requirements to implement erosion and sediment control measures. Actual quantities used may vary from the Base PPP and amendment of the plan will be documented via fieldbook entries or by contract modification. Additional erosion and sediment control items may be required as determined by the inspector and/or contractor during storm water monitoring inspections. If the work involved is not applicable to any contract items, the work will be paid for according to Article 1109.03 paragraph B.
1. EROSION AND SEDIMENT CONTROLS
- a. Stabilization Practices
- 1) Site plans will ensure that existing vegetation is preserved where attainable and disturbed portions of the site will be stabilized.
  - 2) Stabilization measures shall be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased.
  - 3) Temporary stabilizing seeding shall be completed as the disturbed areas are constructed. If construction activity is not planned to occur in a disturbed area for at least 21 days, the area shall be stabilized by temporary seeding or mulching within 14 days. Other stabilizing methods shall be used outside the seeding time period.
  - 4) Stabilization measures to be used for this project are located in the Estimated Project Quantities (100-1A) and Estimate Reference Information (100-4A) located on the C sheets of the plan. Additional items may be found in the Inspector's Daily Reports (IDR) or Contract Modifications.
- b. Structural Practices
- 1) Structural practices will be implemented to divert flows from exposed soils and detain or otherwise limit runoff and the discharge of pollutants from exposed areas of the site.
  - 2) Structural items to be used for this project are located in the Estimated Project Quantities (100-1A) and Estimate Reference Information (100-4A) located on the C sheets of the plan, as well as all other item specific Tabulations. Typical drawings detailing construction of the devices to be used on this project can be found on the B sheets of the plan or are referenced in the Standard Road Plans Tabulation.
- c. Storm Water Management
- 1) Measures shall be installed during the construction process to control pollutants in storm water discharges that will occur after construction operations have been completed. The installation of these devices may be subject to Section 404 of the Clean Water Act.
2. OTHER CONTROLS
- a. Contractor disposal of unused construction materials and construction material wastes shall comply with applicable state

POLLUTION PREVENTION PLAN

- and local waste disposal, sanitary sewer, or septic system regulations. In the event of a conflict with other governmental laws, rules and regulations, the more restrictive laws, rules or regulations shall apply.
- 1) Vehicle Entrances and Exits - Construct and maintain entrances and exits to prevent tracking of sediments onto roadways.
  - 2) Material Delivery, Storage and Use - Implement practices to prevent discharge of construction materials during delivery, storage, and use.
  - 3) Stockpile Management - Install controls to reduce or eliminate pollution of storm water from stockpiles of soil and paving.
  - 4) Waste Disposal - Do not discharge any materials, including building materials, into waters of the state, except as authorized by a Section 404 permit.
  - 5) Spill Prevention and Control - Implement procedures to contain and clean-up spills and prevent material discharges to the storm drain system and waters of the state.
  - 6) Concrete Residuals and Washout Wastes - Designate temporary concrete washout facilities for rinsing out concrete trucks. Provide directions to truck drivers where designated washout facilities are located.
  - 7) Vehicle and Equipment Cleaning - Employ washing practices that prevent contamination of surface and ground water from wash water.
  - 8) Vehicle and Equipment Fueling and Maintenance - Perform on site fueling and maintenance in accordance with all environmental laws such as proper storage of onside fuels and proper disposal of used engine oil or other fluids on site.
  - 9) Litter Management - Ensure employees properly dispose of litter.
3. APPROVED STATE OR LOCAL PLANS
- During the course of this construction, it is possible that situations will arise where unknown materials will be encountered. When such situations are encountered, they will be handled according to all federal, state, and local regulations in effect at the time.

IV. MAINTENANCE PROCEDURES

The contractor is required to maintain all temporary erosion and sediment control measures in proper working order, including cleaning, repairing, or replacing them throughout the contract period. This shall begin when the features have lost 50% of their capacity.

V. INSPECTION REQUIREMENTS

- A. Inspections shall be made jointly by the contractor and the contracting authority at least once every seven calendar days and after each rain event that is ¼" or greater. Storm water monitoring inspections will include:
1. Date of the inspection.
  2. Summary of the scope of the inspection.
  3. Name and qualifications of the personnel making the inspection.
  4. Rainfall amount.
  5. Review erosion and sediment control measures within disturbed areas for the effectiveness in preventing impacts to receiving waters.
  6. Major observations related to the implementation of the PPP.
  7. Identify corrective actions required to maintain or modify erosion and sediment control measures.
- B. Include storm water monitoring inspection reports in the Amended PPP. Incorporate any additional erosion and sediment control measures determined as a result of the inspection. Immediately begin corrective actions on all deficiencies found and complete all actions within 3 calendar days of the inspection.

VI. NON-STORM WATER DISCHARGES

This includes subsurface drains (i.e. longitudinal and standard subdrains) and slope drains. The velocity of the discharge from these features may be controlled by the use of patio blocks, Class A stone, erosion stone or other appropriate materials.

VII. POTENTIAL SOURCES OF OFF RIGHT-OF-WAY (ROW) POLLUTION

Silts, sediment, and other forms of pollution may be transported onto highway right-of-way (ROW) as a result of a storm event. Potential sources of pollution located outside highway ROW are beyond the control of this PPP. Pollution within highway ROW will be conveyed and controlled per this PPP.

VIII. DEFINITIONS

- A. Base PPP - Initial Pollution Prevention Plan.
- B. Amended PPP - May include Plan Revisions or Contract Modifications for new items and fieldbook entries made by the inspector.
- C. IDR - Inspector's Daily Report - this contains the inspector's daily diary and item postings.
- D. Controls - Methods, practices, or measures to minimize or prevent erosion, control sedimentation, control storm water, or minimize contaminants from other types of waste or materials.
- E. Signature Authority - Representative from Designer, Contractor/Subcontractor, or RCE/Inspector authorized to sign various storm water documents.

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GRADING FOR GUARDRAIL INSTALLATIONS															107-23 10-18-11	
① Lane(s) to which the installation is adjacent.															Refer to EW-301	
Location				Foreslope at Guardrail	Dimensions (Feet)								Earthwork		Remarks	
No.	① Direction of Traffic	Station	Side		X1	Y1	X2	Y2	X3	Y3	X4	Y4	Z	Excavation Class 10		Embankment In Place
														CY		CY
1		306+84.75	Lt	3:1	27.5	5.0				77.4	7.0	47.0	(1)		(1) Class 10 quantity is already included in the the 'T' Sheet earthwork quantities. For more information refer to Sheet T.1 and the cross sections.	
2		307+21.67	Rt	6:1	40.0	5.0				127.3	6.5	45.0	(1)			
3		309+07.67	Rt	6:1	40.0	5.0				127.3	6.5	45.0	(1)			
4		309+44.59	Lt	6:1	27.5	5.0				77.4	7.0	47.0	(1)			

108-8A  
10-19-10

STEEL BEAM GUARDRAIL AT CONCRETE BARRIER OR BRIDGE END POST

Refer to BA-200, BA-201, BA-202, BA-205, BA-250, SI-172, SI-173 and SI-211.

① See Standards for list of materials.

Location Station			Layout Lengths				Delineators and Object Markers				Bid Items ①						Remarks	
			VT1	VF	VT2	ET Terminal	Type	Delineator		Object Marker		End Anchor Bolted	Barrier Transition Section	Steel Beam Guardrail	End Terminal			Adapter
								Type 1	Type 2	Type 3					Standard	Flared for Cable Connection		
										White No.	No.	OM-3L No.	OM-3R No.	BA-202 Type				BA-201 No.
No.	Station	Offset	LF	LF	LF	LF												
1	306+84.75	22.8' Lt	28.125			50.0	3			1		1	1	0.0	1			Trailing
2	307+21.67	22.8' Rt	40.625	37.50		50.0	3				1	1	1	50.0	1			Approaching
3	309+07.67	22.8' Lt	40.625	37.50		50.0	3				1	1	1	50.0	1			Approaching
4	309+44.59	22.8' Rt	28.125			50.0	3			1		1	1	0.0	1			Trailing
TOTALS										2	2	4	4	100.0	4			

100-10 10-18-11				
FLOATING SILT CURTAINS				
Refer to EC-202				
Station	Hanging	Containment	Clean-out (Containment)	Remarks
	LF	LF	LF	
308+14.67	410.0	410.0	820.0	ROW = 205' Width

100-17 04-20-10				
TABULATION OF SILT FENCES				
Refer to EC-201				
Location			Length LF	Remarks
Begin Station	End Station	Side		
Detour 150				
1304+50.00	1306+50.00	Rt	220.0	
1306+50.00	1308+25.00	Rt	195.0	
1309+00.00	1311+00.00	Rt	220.0	
1311+00.00	1313+00.00	Rt	220.0	
1313+00.00	1315+00.00	Rt	220.0	
1305+50.00	1307+50.00	Lt	220.0	
1309+50.00	1311+50.00	Lt	220.0	
ML 150				
305+00.00	306+75.00	Rt	195.0	
306+75.00	308+50.00	Rt	195.0	
305+75.00	310+00.00	Rt/Lt	660.0	Along Bear Creek Bank
306+50.00	310+50.00	Rt/Lt	660.0	Along Bear Creek Bank
309+50.00	311+50.00	Rt	220.0	
311+50.00	313+50.00	Rt	220.0	
305+75.00	306+75.00	Lt	120.0	
309+00.00	311+00.00	Lt	220.0	
311+00.00	313+00.00	Lt	220.0	
TOTAL			4225.0	

100-18  
04-20-10

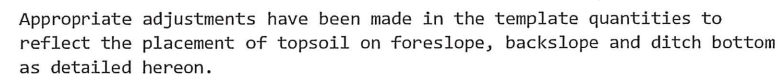
TABULATION OF SILT FENCES  
FOR DITCH CHECKS

Refer to EC-201

Location Station	Side	Length	Remarks
		LF	
Detour 150			
1305+75.00	Rt	17.0	
1307+25.00	Rt	22.0	
1308+00.00	Rt	22.0	
1308+65.00	Rt	30.0	Protect Stream Bank
1306+50.00	Lt	15.0	
1307+00.00	Lt	15.0	
1307+75.00	Lt	15.0	
1308+25.00	Lt	20.0	Protect Stream Bank
1309+00.00	Lt	19.0	Protect Stream Bank
1309+75.00	Lt	22.0	
1310+50.00	Lt	22.0	
1311+25.00	Lt	22.0	
1312+00.00	Lt	16.0	
ML 150			
305+50.00	Rt	23.0	
306+25.00	Rt	23.0	
307+00.00	Rt	23.0	
307+75.00	Rt	23.0	
308+45.00	Rt	23.0	Protect Stream Bank
308+00.00	Lt	23.0	Protect Stream Bank
308+75.00	Lt	23.0	
309+50.00	Lt	23.0	
310+25.00	Lt	23.0	
311+00.00	Lt	23.0	
TOTAL		487.0	

- Calculations assume a HMA unit weight (lbs/cf) of 147, a Special Backfill unit weight (lbs/cf) of 140, and a Granular Shoulder unit weight (lbs/cf) of 140.

## TABULATION OF SPREADING TOPSOIL



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108-30  
10-16-12

CRASH CUSHIONS

\* Bid Item

① Lane(s) to which the installation is adjacent.

② Complete this section when using the Temporary Crash Cushion bid item. Refer to BA-500

No.	① Direction of Traffic	Location Station	Side	Obstacle Width	Crash Cushion (Select One)*					Sand Barrel Details ②					Earthwork*		Spare Parts Kit (Select One)*		Obstacle Description	Remarks
					Temporary	Temporary Redirective	Temporary Severe Use	Permanent	Permanent Severe Use	V	W	X	Y	Z	Excavation Class 10	Embankment in Place	Permanent	Permanent Severe Use		
										Length	Length	Length	Length	Length						
				FT	FT	FT	FT	FT	CY	CY	EACH	EACH								
1		1307+51.54	Lt	1.88	X					5.88	24.25	11.13	9.13	13.58	* 6.0				TBR for Detour Bridge	
2		1307+51.54	Rt	1.88	X					5.88	24.25	11.13	9.13	13.58	* 5.0				TBR for Detour Bridge	
3		1309+88.49	Lt	1.88	X					5.88	24.25	11.13	9.13	13.58	* 4.0				TBR for Detour Bridge	
4		1309+88.49	Rt	1.88	X					5.88	24.25	11.13	9.13	13.58	* 4.0				TBR for Detour Bridge	
TOTALS					4										* 19.0				* Quantity included in earthwork quantities on 'T' Sheets.	

108-33 04-20-10						
TEMPORARY BARRIER RAIL						
Refer to BA-400 and BA-401						
No.	Station to Station		Length	(Select One)		Remarks
				Concrete BA-401	Steel BA-400	
1	1307+51.50	1309+88.50	237.5	X		Left Side
2	1307+51.50	1309+88.50	237.5	X		Right Side
TOTAL			475.0			

108-27 10-16-12				
TEMPORARY FLOODLIGHTING LUMINAIRES				
No.	Location Station	Offset	Number Lumin.	Remarks
1	302+18.74	Rt	1	
2	315+55.69	Rt	1	
TOTAL			2	


112-6

10-21-08

BRIDGE APPROACH SECTION

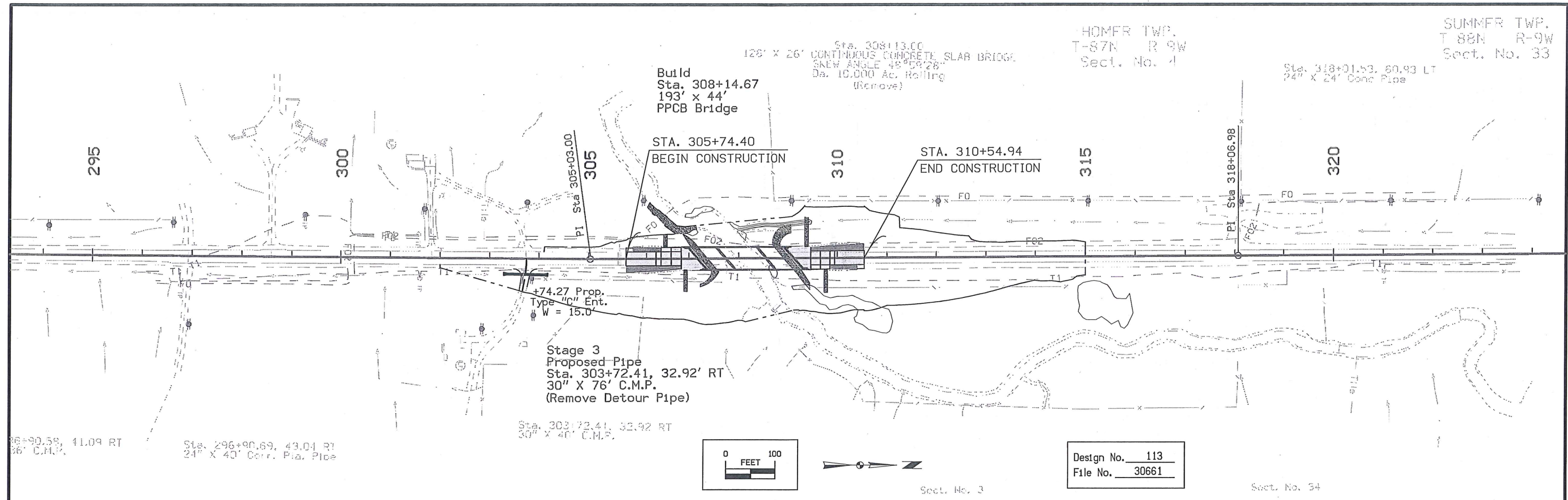
Refer to the RK-Series.

\* Not a bid item

Location		Approach Pavement					Fixed or Movable Abutment	Subdrain					Modified Subbase	Polymer Grid	Remarks
Bridge Station	End		Pay Length	Non-Reinf. Pavement Area	Single-Reinf. Pavement Area	Double-Reinf. Pavement Area		*	Subdrain Outlet		*	Class 'A'*			
		Thickness	FT	SY	SY	SY		F or M	Perforated Subdrain 4"	STA	Side	CY			
308+14.67	S	12.0	83.5	93.3	62.2	167.1	M	72.0	306+44.49	Rt	12.0		342.500	363.8	
308+14.67	N	12.0	83.5	93.3	62.2	167.1	M	64.0	309+84.89	Rt	11.0		342.500	363.8	
		TOTALS	167.0	186.6	124.4	334.2		136.0			23.0		685.000	727.6	

SCOUR PROTECTION OR ROCK FLUME FOR BRIDGE END DRAIN												104-8A 04-20-10 ① Not a Bid Item	
Refer to Standard Road Plan RF-39 or RF-40													
Location			Shoulder				Rock Flume RF-40			Scour Protection RF-39		Remarks	
Bridge Station	Bridge Corner	Distance DI-1 or DI-2	Panels Required	PCC	Polymer Grid ①	Modified Subbase ①	Macadam Stone Base ①	Engineering Fabric ①	Erosion Stone ①	Outlet or Channel Scour Protection	Turf Reinforced Mat (TRM)		
			A B C or D	Sq.Yds.	Sq.Yds.	Tons	Material Tons	Sq.Yds.	Tons	Sq. Feet	Squares		
308+14.67	SW	33.5	B, C	42.7	51.6	32.500		33.7	23.700				
308+14.67	SE	30.4						56.0	39.400				
308+14.67	NW	30.4						76.5	53.900				
308+14.67	NE	33.5	B, C	42.7	51.6	32.500		60.2	42.400				

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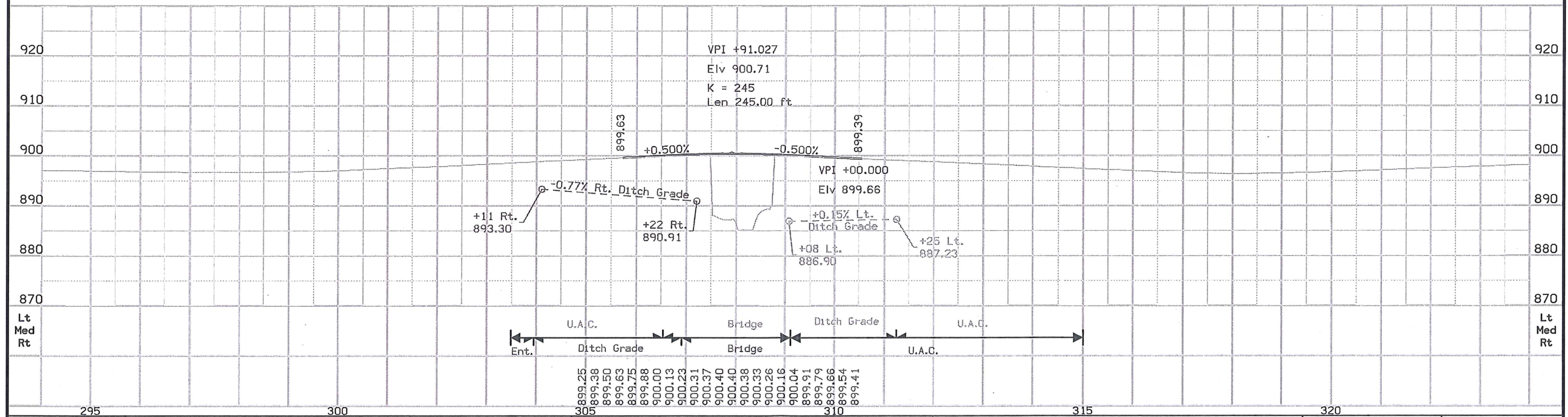
### Stage 2

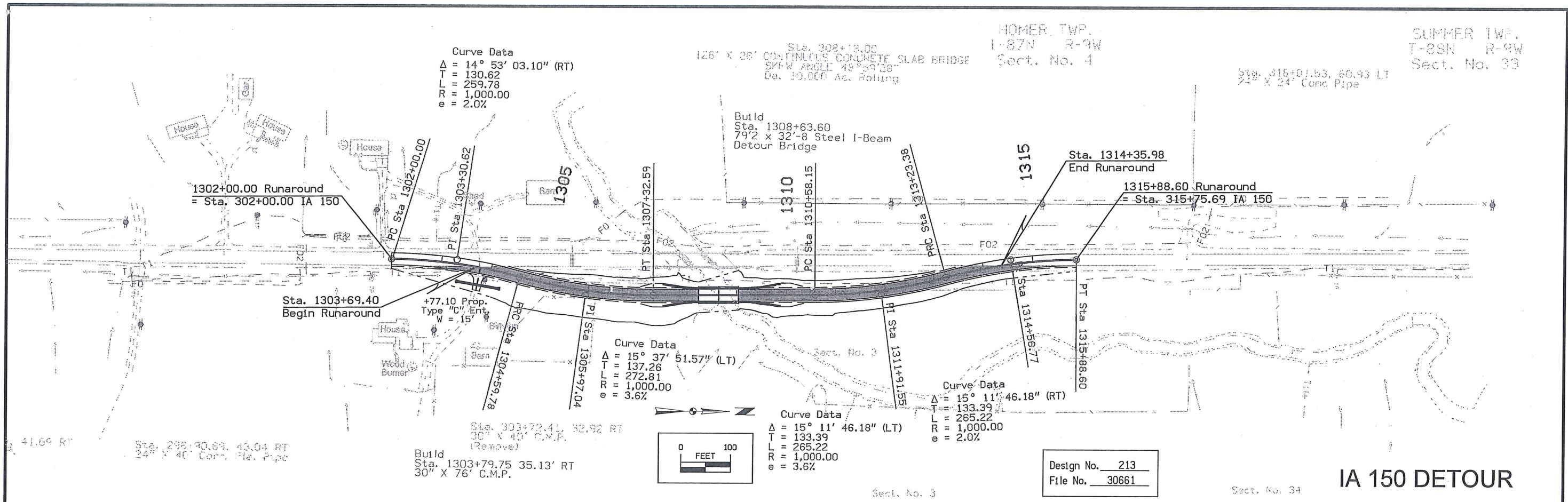
Cut = 1853 CY    Fill+30% = 2713 CY  
 Borrow = 860 CY  
 = 2713 CY                      = 2713 CY

### Stage 3

Cut = 7923 CY    Fill+30% = 1303 CY  
 Waste = 6620 CY  
 = 7923 CY                      = 7923 CY

Topsoil Cut from ML = 208 CY    Topsoil  
 Topsoil Cut from Detour = 366 CY    Fill+40% = 1550 CY  
 Topsoil Borrow = 976 CY  
 = 1550 CY                      = 1550 CY





Stage 1

Cut = 636 CY	Fill+30% = 8925 CY
Core-out = 1026 CY	
Borrow = 7263 CY	
= 8925 CY	= 8925 CY

